

BEIYAYEV, V.A.

On absolute convergence of a power series with two variables.
Dokl. AN SSSR 148 no.1:13-14 Ja '63. (MIRA 16:2)

1. Moskovskiy gosudarstvennyy pedagogicheskiy institut im. V.I.
Lenina. Predstavleno akademikom P.S. Novikovym.
(Series)

BELIAYEV, V.A. (Moskva)

Sets of convergence and absolute convergence of power series
with two variables. Mat. sbor. 62 no.1:39-52 S '63.
(MIRA 16:10)

(Series)

BELYAYEV, V.A.; ERKOVNOV, N.N.

Electrostatic channel for injecting an ion beam into a magnetic
trap. Atom.energ. 13 no.6:581-583 D '62. (MIRA 15:12)
(Ion beams) (Magnetic fields)

Letter to the Editor. Maximal Cross Section
of a Nonresonance Charge Exchange

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SOV/56-37-6-40/55

the target atom or by the decrease of the first ionization potential. A similar increase in σ_{\max} with an increase in N and a decrease in $|\Delta E|$ was also observed for two-electron charge exchange of He^+ ions in inert gas, which leads to the formation of metastable He^- ions (cf., V. M. Dukel'skiy, V. V. Afrosimov, N. V. Fedorenko, Zhur. Eksp. i Teoret. Fiz., 30, 792, 1956). There is 1 graph; and 11 references, 6 Soviet, 4 U.K., 1 U.S. The U.S. and U.K. references are: J. B. Hasted, Proc. Roy. Soc., A205, 421 (1951); J. B. Hasted, Proc. Roy. Soc., A212, 235 (1952); J. B. H. Stedeford, J. B. Hasted, Proc. Roy. Soc., A227, 466 (1955); H. B. Gilbody, J. B. Hasted, Proc. Roy. Soc., A238, 334 (1957); R. J. Carbone, E. N. Fals, E. Everhart. Phys. Rev., 102, 1524 (1956).

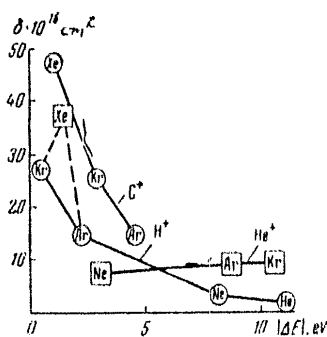
ASSOCIATION: Leningrad Phys.-Tech. Institute Academy of Sciences
USSR (Leningradskiy fiziko-tekhnicheskii institut,
Akademii nauk SSSR)

SUBMITTED: August 14, 1959

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Letter to the Editor. Maximal Cross Section
of a Nonresonance Charge Exchange

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The graph shows the relation between $\sigma_{\max} (|\Delta E|)$ for one-electron charge exchange C^+ , He^+ , and H^+ in inert gases. The points corresponding to charge exchange of the same ion are connected by a line. The increase in σ_{\max} with increase in N during charge exchange in inert gases can be explained by the increase in the dimension of the external shell of

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Letter to the Editor. Maximal Cross Section
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the atom-target, N . It was shown that σ_{\max} increases with an increase in N and decreases with an increase in $|\Delta E|$. Two characteristic cases are possible for an ion and different atoms: (1) If $|\Delta E|$ increases uninterruptedly and N decreases, the σ_{\max} decreases rapidly so that both factors act in the same direction; (2) If both $|\Delta E|$ and N increase, both factors have the effect in the opposite directions, and the term σ_{\max} gradually increases in its transition from one atom to another. These characteristics are illustrated graphically in the figure below:

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BELYAYEV, V A.

24.6200, 16.8100

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SOV/56-37-6-40/55

AUTHORS: Fedorenko, N. V., Belyaev, V. A.

TITLE: Letter to the Editor. Maximal Cross Section of a Nonresonance Charge Exchange

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1808-1810 (USSR)

ABSTRACT: The reaction $1^+ + A \rightarrow 1^0 + A^+ \Delta E$ (where ΔE is defect in resonance) was taken as the definition of the nonresonance one-electron charge exchange. The previous studies of N. V. Fedorenko (cf., Zhur. Eksp. i Teoret. Fiz., 24, 2113, 1954) and N. V. Fedorenko, V. V. Afrosimov and D. M. Kaminker (cf., ibid., 26, 1929, 1956) show that with an increase in the absolute magnitude of the resonance defect $|\Delta E|$ the velocity corresponding to the maximal cross section (σ_{\max}) increases according to the Massy criterion. An analysis was made which determined the effect of σ_{\max} on the absolute magnitude of the resonance defect and on the numerical order of

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BELYAYEV, V.A.

24.2.20
 65702
 Granovskiy, V.L., Luk'yanov, S.Yu., Spivak, G.V. and
 Sirotenko, I.G.
 Report on the Second All-Union Conference on Gas
 Electronics
 PERIODICAL: Radiotekhnika i elektronika, 1959, Vol. 4, Nr 8,
 pp 1339 - 1358 (USSR)
 ABSTRACT: The conference was organized by the Ac.Sc.USSR, the
 Ministry of Higher Education and Moscow State University.
 Formation of a Breakdown.
 I.B. Fogel'son - "Methods of Reducing the Energy Lost in the
 Formation of a Breakdown".
 I.I. Pivovarov and V.I. Gordiyenko - "Microdischarges and
 Breakdown Currents Between Metal Electrodes in High
 Vacuum".
 V.A. Simonov and G. Katkov - "Investigation of the
 Processes of Initiation and Development of a High-voltage
 Discharge in Vacuum".
 I.M. Reymondal and G.V. Smirnovskaya - "The Character-
 istics of Ignition in High-voltage Discharges".
 I.V. Kuznetsov - "Investigation of the Processes of the
 Material during the pre-breakdown stage in vacuum".
 M.B. Rozanov et al. - "The Motion of Micro-particles of
 Substances During Electric Breakdown in Vacuum".
 The third section dealt with the problems of electric
 sparks, corona and the practical applications of these
 phenomena. The following papers were read:
 V.I. Levitov et al. - "Probe Investigation of the a.c.
 Corona Fields".
 G.B. Alexandrov - "Elementary Processes in the Ionization
 of Gases in the Corona Discharge".
 V.A. Rumakina - "Appearance of a Corona Discharge in
 Hydrogen and Nitrogen".
 P.M. Chistyakov et al. - "Some Properties of the Corona
 Discharge in Hydrogen in Coaxial, Cylindrical Systems".
 A.S. Soboleva and B.M. Rikhsel - "The Properties of the
 Phenomena Between a Point and a Plane at Gas Pressures of
 10⁻³ - 1.0 mm Hg".
 A.I. Kuznetsov et al. - "Methods of Unipolar Ionization of
 Gases in the Corona Discharge" (see p 1335 of the journal).
 M.P. Vanyukov et al. - "Fine Spectra of the Radiation of
 a Spark Discharge in Inert Gases" (see p 1284 of the
 journal).
 M.P. Vanyukov and A.A. Mak - "Production of High
 Temperatures by Means of a Spark Discharge".
 I.I. Pivovarov et al. - "The Properties of the Magnetic Field of
 the Corona Discharge on the Dividing Surface of Two Media".
 I.S. Stokol'mikov - "New Data from the Study of Long
 Sparks".
 M.Y. Shteyn - "Properties of the Breakdown of Compressed
 Air in a Comparatively Uniform Field in the Presence of
 Localized non-uniformities".
 A.Y. Vanyukov - "Pulse and Oscillographic
 Techniques for the Measurement of the Discharge Lags
 in Dielectrics" (see p 1257 of the journal).
 A paper by B.N. Zolotarev dealt with the problems of the
 basic theory of the electric erosion (see p 1350 of the
 journal).
 The fourth section was presided over by S.Yu. Luk'yanov
 and was concerned with the non-stationary and low-
 frequency discharges. The following papers were read:
 I.G. Kozlovskiy and A.A. Labud - "The Nature of the
 Current Interruption During the Electric Explosion of
 a Metal Wire".
 V.A. Simonov - "Propagation of Plasma from Local Pulse
 Sources".
 G.B. Timofeyev et al. - "Observation of an Electro-
 dynamically Compressed Arc by Means of an Electron-optical
 Converter".
 I.B. Fogel'son and I.Ye. Kuchanov - "Investigation of
 the Properties of the Corona Discharge in Magnetically
 Anisotropic Media".
 V.A. Makarov and M.K. Romanovich - "Experiments with an
 Electron Model of a System with Magnetic Samples".
 A.M. Andrianov et al. - "Distribution of Magnetic and Electric
 Fields in Powerful Pulse Discharges".
 I.G. Kozlovskiy and A.A. Labud - "Spectroscopic Determination
 of the Plasma Temperature in the Corona Discharge"
 (see p 1326 of the journal).
 The paper by Harding aroused a lot of interest and
 Academician L.A. Arfandovich expressed the opinion that
 the electric erosion phenomenon is the "Zeta" should
 be the "Zeta" instead of the "Zeta" according to Harding.
 The paper by Harding aroused a lot of interest and
 Academician L.A. Arfandovich expressed the opinion that
 the electric erosion phenomenon is the "Zeta" should
 be the "Zeta" instead of the "Zeta" according to Harding.

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~~BELYAYEV, V. A. - BELYAYEV, V. A.~~
ANTROPOV, G. M., BELYEV, V. A. and ROMANOVSKIY, M. K.

"The Behavior of Rapid Electrons in an Electron Model of a Trap with Magnetic Mirrors." (Work carried out in 1957); pp. 250-258.

"The Physics of Plasmas; Problems of Controlled Thermonuclear Reactions." Vol. III. 1958, published by Inst. Atomic Energy, Acad. Sci. USSR.
resp. ed. M. A. Leontovich, editorial work V. I. Kogan.

Available in Library.

L 7015-66

ACC NR: AP5026829

SOURCE CODE: UR/0286/65/000/017/0116/0116

AUTHOR: Vedernikov, I. I.; Belyayev, V. G. 22
44 44 20

ORG: none

TITLE: A method for defrosting food products frozen in bulk. Class 53, No. 174519

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 116

TOPIC TAGS: nutrition, food technology 44

ABSTRACT: This Author's Certificate introduces a method for defrosting food products frozen in bulk, e. g. small fish, by using running water. The process is speeded up by simultaneously passing a power frequency current through the product.

UDC: 664.8.037.59.637.56

SUB CODE: GO,LS/

SUBM DATE: 15Jan60/

ORIG REF: 000/

OTH REF: 000

60
Card 1/1

L 7879-66 EWT(m)/EPP(c)/EWP(j)/T RPL RM
 AGC NR: AP5025030 SOURCE CODE: UR/0286/65/000/016/0083/0083

AUTHORS: Belyayev, V. A.; Gromova, V. A.; Zemit, S. V.; Kavrayskaya, N. L.;
Kopylov, Ye. P.; Kosmodem'yanskiy, L. V.; Kostin, D. L.; Kut'in, A. M.;
Lazaryants, B. G.; Romanova, R. G.; Tsaylingol'd, V. L.; Shikhalova, K. P.;
Shushkina, Ye. N.

ORG: none

TITLE: Method for obtaining synthetic rubber. Class 39, No. 173942

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 16, 1965, 83

TOPIC TAGS: rubber, synthetic rubber, butadiene, styrene, polymer, copolymer, *polymerization*

ABSTRACT: This Author Certificate presents a method for obtaining synthetic rubber by polymerization or copolymerization of dienes with vinyl monomers, for example, butadiene with α -methylstyrene, in aqueous emulsion at low temperatures in the presence of known free-radical-initiators and regulators employing emulsifiers. To improve the polymer properties, esters of monoalkylbenzoic acid are used as emulsifiers.

SUB CODE: 1607/
 Card 1/1 nw

SUBM DATE: 03Jul63

UDC: 678.762 678.762-134

L 21810-66

ACC NR: AP6012186

perform the work and for continuous interest, and N. V. Fedorenko, V. V. Afrosimov,
and R. N. Il'in for a discussion of the method. 3

SUB CODE: 20/ SUBM DATE: 25Feb66/ OTH REF: 002

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PE

L 21810-66
ACC NR: AP6012186

3

Electronic and Atomic Collisions, Quebec, 1965). The authors have constructed a setup based on the described principle, and carried out preliminary measurements. The process chosen for investigation was resonance charge exchange of protons with hydrogen atoms. The proton beam came from an ion source of the oscillating type. The mixed atom-ion beam was obtained by partial charge exchange of a beam of (1150 ± 9) ev protons, with a gas target ahead of the entrance to the collision chamber. The protons produced from the atoms as a result of the charge exchange in the collision chamber acquired on leaving the collision chamber an additional energy, which made it possible to separate them subsequently from the total particle stream and to register them. The cross section of the process was calculated from the current of these newly produced protons. The cross section value obtained in a preliminary experiment, $(5.45 \pm 1.35) \times 10^{-15} \text{ cm}^2$ at an energy (31.8 ± 3.6) ev, is in satisfactory agreement with the only experimental results obtained for this interaction in this energy range. It is concluded that the overtaking-beam method can be used to study not only collisions between ions and atoms of the same element but also ion-ion and ion-atom collisions for different vapors and gases (both atomic and molecular), and is therefore quite promising for the study of ion-atom collision processes at low energies, down to fractions of an electron volt. The authors thank L. A. Artsimovich, M. K. Romanovskiy, and A. M. Andrianov for the opportunity to

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L 21810-66 EWT(1) IJP(c) AT
ACC NR: AP6012186

SOURCE CODE: UR/0386/66/003/008/0321/0323

AUTHOR: Belyayev, V. A.; Brezhnev, B. G.; Yerastov, Ye. M.

ORG: none

TITLE: Measurement of the cross sections of ion-atom collisions at low energies by the method of overtaking beams

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 8, 1966, 321-323

TOPIC TAGS: ion beam, ion interaction, atom, particle collision, collision cross section

ABSTRACT: It is shown that the difficulties involved in the measurement of the cross sections of ion-atom collisions at energies below ~100 ev by customary methods can be eliminated by providing conditions whereby the two colliding particles, while having a low energy relative to each other, but each particle has sufficiently high energy in the laboratory frame. The low interaction energy is brought about by having the two particles have a small difference in velocity at the instant of collision. Conditions of this kind can be obtained when monochromatic particle beams cross at a small angle ("overtaking beams"). A similar idea was recently advanced by S. M. Trujillo et al. (IV Int'l. Conf. on the Physics of

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MEDVEDEV, Yu.A.; VASIL'YEV, G.A.; BELYAYEV, V.A.

Increase in oxygen requirement during irradiation as a nonspecific
reaction realized through the adrenal cortex. Radiobiologia 5
no.1:149-150 '65. (MIRA 18:3)

VASIL'YEV, G.A.; BELYAYEV, V.A.

Protective effect against X rays of the adaptation to hypoxia
in combination with an acute hypoxia. Radiobiologiya 3 no.1:
117-120 '63. (MIRA 16:2)
(ANOXEMIA) (X RAYS--PHYSIOLOGICAL EFFECT)

A study of the alkaline fission ...

S/079/62/032/011/001/012
D204/D307

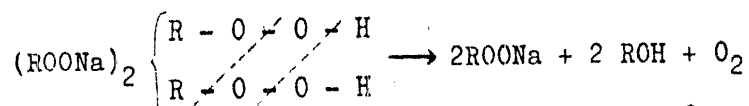
ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinte-
ticheskogo kauchuka imeni S.V. Lebedeva (All Union
Scientific Research Institute of Synthetic Rubber ime-
ni S.V. Lebedev)

SUBMITTED: November 4, 1961

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A study of the alkaline fission ...

S/079/62/032/011/001/012
D204/D307



(3) interaction of O_2 with the simultaneously formed R^\bullet (from the fission products RO^\bullet and OH^\bullet of monomeric B, which had interacted with the solvent RH), i.e. $R^\bullet + O_2 \rightarrow ROO^\bullet$ and $ROO^\bullet + RH \rightarrow ROOH + R^\bullet$. This mechanism was confirmed by measurement of the yields of carbinol ROH during the fission reactions, in the presence and absence of p-benzoquinone. The thermal decomposition is believed to proceed mainly by O-O fission and formation of RO^\bullet , whilst the alkaline fission is chiefly the result of non-radical reaction (2). An exactly analogous mechanism is proposed for the alkaline fission of A in aqueous media. In accordance with theoretical expectations, experiments with the hydroxides of Na, K and Ba showed that the rates of fission increased with increasing field strength of the cation, (i.e. $Ba > Na > K$), and were strongly decreased in the presence of large amounts of water (owing to the aqueous decomposition of the most active $[B]_2$ complex. There are 4 figures and 4 tables.
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S/079/62/032/011/001/012
D204/D307

AUTHORS: Belyayev, V.A., and Nemtsov, M.S.

TITLE: A study of the alkaline fission of iso-propylbenzene
hydrogen peroxide (A). IV Mechanism of the reaction

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 11, 1962, 3483-3493

TEXT: The present paper is a continuation of earlier work (ZhOKh, 32, 3113, 1962), in which it was shown that the alkaline fission of A proceeds via the formation of $[ROONa.ROOH]_n$, where $R = PhCMe_2$ and $n = 1$ or 2 (compound $[B]_n$). Consideration of published data and of the initiation of the polymerization of styrene by thermally decomposed A and B showed that free radicals may form during both thermal and alkaline fissions of A and B. The alkaline fission in anhydrous media of A is believed to proceed by (1) formation of B, largely by dipole-dipole or H-bond interactions, followed by some dimerization, (2) fission of the dimer: ✓

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A study of the alkaline fission ...

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D204/D307

Scientific Research Institute of Synthetic Rubber im-
ni S.V. Lebedev)

SUBMITTED: November 4, 1961

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A study of the alkaline fission ...

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side reactions $\text{ROONa} + \text{ROH} \rightleftharpoons \text{ROOH} + \text{RONa}$ and $\text{ROONa} + \text{PhCOOH} \rightarrow \text{ROOH} + \text{PhCOONa}$. The rates and the extent of decomposition at 50°C . were considerably accelerated in the presence of polar compounds (dimethylphenyl carbinol, acetophenone, phenyl- α -naphthylamine) the effect increasing with increasing dipole moment of the additive, suggesting the formation of highly reactive complexes by dipole association. The increased tendency of higher complexes, $[\text{A}]_n$ towards decomposition is ascribed to the occurrence of reverse reactions between ROONa and reaction products. The decomposition rates of $[\text{A}]_n$ are initially slowed down by free ROOH , owing to the formation of stabler complexes. The mechanism of the alkaline fission of ROOH was shown to be the same in both anhydrous and aqueous media, although in the latter case the reaction was not accelerated in the presence of dimethylphenyl carbinol. The activation energy for the thermal decomposition of $[\text{A}]_n$ has been found to be 18 ± 0.5 kcal/mole between 30 and 50°C . There are 9 figures and 3 tables.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni S.V. Lebedeva (All-Union
Card 2/3

S/079/62/032/010/001/008
D204/D307

AUTHORS: Belyayev, V.A., and Nemtsov, M.S.

TITLE: A study of the alkaline fission of iso-propyl benzene hydrogen peroxide. III. Kinetics of the thermal decomposition of the complex ROONa·ROOH

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 10, 1962;
3113 - 3122

TEXT: The thermal decomposition of ROONa·ROOH (A), where $R = C_6H_5(CH_3)_2-$, was studied in continuation of earlier work (ZhOKh, 31, 3861, 1961). The decomposition of A dissolved in iso-propylbenzene at 50°C was of the kinetic order ~ 1.35 w.r.t. A. This is attributed to the formation of a dimer, $[A]_2$, which decomposes more readily, the respective velocity constants for A and $[A]_2$ being in the ratio of 1 : 7. The final degree of decomposition (63 %) exceeded that demanded by $ROONa·ROOH \rightarrow ROONa + ROH + \frac{1}{2} O_2$ (50 %), owing to

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S/079/61/031/012/002/011
D227/D301

The decomposition of iso-propyl ...

rences to the English-language publications read as follows: M.
Kharasch, A. Fono, W. Nudenberg, J. Org. Ch., 17, 207 (1952); M.
Kharasch, A. Fono, W. Nudenberg, J. Org. Ch., 16, 113 (1951); L.
Bateman, H. Hughes, J. Chem. Soc., (1952), 4594.

SUBMITTED: January 9, 1961

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X

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D227/D301

The decomposition of iso-propyl ...

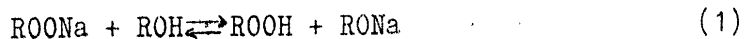
association of the complex, its molecular weight was determined by the cryoscopic method, using dry benzene. The molecular weight coincided with the molecular weight of the dimer $(\text{ROONa} \cdot \text{ROOH})_2$; on dilution, however, a reversion to the monomer was observed. The molecular weights of iso-propyl benzene-hydrogen peroxide solutions were also determined, finding that in very dilute solutions no association of the compound occurs. When the concentration was increased association occurred, but the molecular weight never reached a maximum and showed a linear increase within the experimental concentration range, indicating the formation of polymeric forms. Formation of the complex is ascribed to hydrogen bonding between the hydroxyl group of the peroxide and one of the oxygens of its sodium salt. Infrared spectra showed that the strength of the hydrogen bond was considerably higher than for the free hydrogen peroxide. The absorption line for the free OH group was absent for 1 M solution of the latter, while in the case of the complex this line appeared for 0.1 M concentrations. There are 9 figures, 3 tables and 11 references: 6 Soviet-bloc and 5 non-Soviet-bloc. The refe-

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The decomposition of iso-propyl ...



The quantity of hydrogen peroxide formed is determined by the end concentration of free dimethyl phenyl carbinol. Assuming that reaction (1) takes place, introduction of dimethyl phenyl carbinol into the reaction should displace the reaction to the left and lower the limit of conversion. The results confirmed that this is the case. In preparing the anhydrous sodium salt, separation of a white solid was observed. The analysis showed that the solid represented a compound of hydrogen peroxide and its salt or dimethyl phenyl carbinol alcoholate. An attempt was then made to obtain the solid directly by mixing equimolar quantities of hydrogen peroxide and its anhydrous sodium salt at about 0°C. The product proved hygroscopic but it was possible to obtain needle-like crystals, in dry nitrogen. Chemical analysis of the latter showed that they represented a compound in which the molar ratio of active oxygen (peroxide) and the sodium ion was 2:1. This complex may be represented by the formula $(\text{ROONa} \cdot \text{ROOH})_n$. To establish the degree of

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The decomposition of iso-propyl ...

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composition of the iso-propyl phenyl benzene hydrogen peroxide and free hydrogen peroxide. The compositions of the starting mixtures were chosen so that the content of the dimethyl phenyl carbinol and its alcoholate in relation to the total quantity of free and bound hydrogen peroxide were constant. The kinetic curves for these systems showed that the addition to the anhydrous sodium hydrogen peroxide salt of free hydrogen peroxide ($\text{ROOH} : \text{ROONa} = 1.23$) not only increased the rate of reaction, but also increased the limit of conversion. Assuming that the anhydrous salt is also stable, the addition of free hydrogen peroxide would give rise to some reactive intermediate compound which would determine the rate of reaction. The existence of the limit of conversion results then from the exhaustion of hydrogen peroxide and the thermal stability of residual sodium salt. This explanation appears to contradict the previous work, in which although the free hydrogen peroxide has not been added, a reaction was observed. In that case, however, free hydrogen peroxide might have been formed as a result of an exchange reaction between the hydrogen peroxide salt and the carbinol, X

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5.3400

S/079/61/031/012/002/011
D227/D301

AUTHORS: Belyayev, V. A., and Nemtsov, M. S.

TITLE: The decomposition of iso-propyl benzene hydrogen peroxide with alkali. II. Some properties of the anhydrous sodium salt of iso-propyl benzene hydrogen peroxide

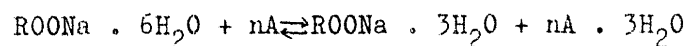
PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 12, 1961, 3861-3869

TEXT: In continuing their investigations concerning the decomposition of iso-propyl benzene hydrogen peroxide with alkali, the authors aimed at preparing an anhydrous sodium salt. The method used consisted of reacting the hydrogen peroxide salt with sodium wire, in ether, at -20 to -25°C. After the removal of solvent, dilution with n-pentane and filtration of sodium and sodium hydroxide, the product was analyzed and found to contain a mixture of dimethyl phenyl carbinol and its sodium alcoholate. Further experiments were concerned with determining a relation between the rate of the de-

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The decomposition of iso-propyl ...

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D227/D301

The possibility of the following reversible reactions: $\text{ROONa} \cdot 3\text{H}_2\text{O} + \text{nROOH} \rightleftharpoons \text{ROONa} + \text{nROOH} \cdot 3\text{H}_2\text{O}$ cannot, however, be eliminated as the displacement of the equilibrium to the left may be favored by cooling. There are 5 figures, 2 tables and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: M. Kharasch, A. Fono, W. Nudenberg, J. Org. Ch., 17, 207, (1952); C. Tipper, Ind. Chem., 35, no. 3, 113 (1959); U.S. pat. 2,632,026 (1953); Ch. A. 48, 2101, (1954).

SUBMITTED: January 9, 1961

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S/079/61/031/012/001/011
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The decomposition of iso-propyl...

system was heated to 50°C and cooled rapidly prismatic crystals were formed. Chemical analysis of both products showed that in the first case a trihydrated salt was obtained while in the second no change occurred. Heating pure hexahydrated salt to 80°C gave an unchanged product, showing that the separation of three molecules of water during the reaction with hydrogen peroxide is due to the per-solvation with the formation of the hydrated form of free iso-propyl benzene hydrogen peroxide. The existence of such a salt has so far been unknown. It may, therefore, be assumed that similar results would be obtained by replacing hydrogen peroxide with other compounds capable of hydrate formation, e.g. dimethyl phenyl carbinol which is formed as a result of the decomposition of iso-propyl benzene hydrogen peroxide with alkali. Again the hexahydrated salt and dimethyl phenyl carbinol were heated to 50 and 80°C and as expected prismatic and plate-like crystals respectively were obtained. The reaction of persolvation of the hexahydrate of hydrogen peroxide when it is reacted with water acceptor A may be represented as follows:

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The decomposition of iso-propyl ...

salt decreased as the concentration of NaOH increased. In the two-phase system this would cause the displacement of the salt into the hydrocarbon layer. The solubility of the hydrated salt in iso-propyl benzene has been found to increase with temperature which means that under the conditions of decomposition (elevated temperature and highly concentrated sodium hydroxide) most of the salt could be found in the hydrocarbon layer. To establish the quantitative relationship between the rate of decomposition and the ratio of free and bound hydrogen peroxide the authors conducted kinetic measurements using predetermined ratios of the latter. The results showed that at 80°C the highest rate of reaction corresponded to the molar ratio of hydrogen peroxide to its salt of 2:1, while the pure sodium salt decomposed at half that rate. At 50°C the decomposition of the pure salt did not occur which indicated certain changes taking place within the reaction system. To verify this statement a mixture of free hydrogen peroxide and its hexahydrated salt in iso-propyl benzene, in which the ROOH:ROONa ratio corresponded to the highest rate of reaction, was heated to 80°C and cooled rapidly. Well defined rectangular crystals were obtained. When the same

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S/072/61/031/012/001/011
D227/D301

AUTHORS: Belyayev, V. A., and Nemtsov, M. S.

TITLE: The decomposition of iso-propyl benzene hydrogen peroxide with alkali. I. Some properties of the aqueous sodium salt of iso-propyl benzene hydrogen peroxide

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 12, 1961, 3855-3860

TEXT: The mechanism of decomposition of iso-propyl benzene hydrogen peroxide with concentrated sodium hydroxide (first stage in α -methyl styrene production) has not so far been explained satisfactorily. It was, therefore, necessary to conduct a detailed study of the properties of the aqueous sodium salt of iso-propyl benzene hydrogen peroxide which according to the earlier works represents a primary intermediate product. The usual decomposition is conducted in heterogeneous two-phase systems and in the first place the solubility of the aqueous hydrogen peroxide salt in both the phases must be considered. It was found that at 20°C the solubility of the

Card 1/4

BELYAYEV, V.A.

Meadow formation on Solonetz soils in virgin lands. Zemledelie 27
no.2:45-47 F '65. (MIRA 18:4)

1. TSelinogradskiy filial Instituta pochvovedeniya AN Kazakhskoy
SSR.

BELYAYEV, V.A.; NEMTSOV, M.S.

Alkaline cleavage of isopropylbenzene hydroperoxide.
Part 4: Mechanism of the reaction. Zhur.ob.khim.
32 no.11:3483-3493 N '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut
sinteticheskogo kauchuka imeni S.V. Lebedeva.
(Hydroperoxide) (Cumene) (Alkalies)

BELYAYEV, V.A.

Possibilities for feed production in the Virgin Territory.
Zhivotnovodstvo 23 no.5:42-49 My '61. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kormov imeni
V.R.Vil'yamsa.
(Virgin Territory—Pastures and meadows)

BELYAYEV, V.A., kand.tekhn.nauk

Determining stresses in systems propeller shaft - propeller during
its impact against a hard object. Trudy GPI 15 no.1:11-20
'61 [i.e. '59]. (MIRA 15:11)
(Ship propulsion) (Strains and stresses)

BELYAYEV, V.A., kand.tekhn.nauk

Ways of reducing strains in the mooring ropes of floating cranes.
Sudostroenie 28 no.6:29-31 Je '62. (MIRA 15:6)
(Floating cranes--Equipment and supplies)
(Strains and stresses)

BELYAYEV, V. A., Candidate Tech Sci (diss) -- "The problem of reducing stresses in a propeller and the propeller shaft when a blade strikes a hard object". Gor'kiy, 1959. 18 pp (Min Higher Educ USSR, Gor'kiy Polytech Inst im A. A. Zhdanov), 150 copies (KL, No 24, 1959, 134)

BELYAYEV, V.A.

Impact of a hard body against propeller blades. Trudy GPI 14
no.1:17-22 '58. (MIRA 13:2)
(Propellers)

BELYAYEV, V.A.

Research in coal storage performed by the Central Scientific
Research Institute of the Ministry of Roads, Railroads and
Waterways. Izv.AN Kazakh.SSR.Ser.khim.no.9:101-108 '56.
(Combustion, Spontaneous)(Coal-Storage) (MIRA 9:7)

BELYAYEV, V.A., inzh.

Panel floors. Biul.tekh.inform. po stroi.5 no.11:16-17
N '59. (MIRA 13:4)
(Parquet floors)

L 43055-66

ACC NR: AP6015002 (A) SOURCE CODE: UR/0209/66/000/005/0046/0049

AUTHOR: Belyayev, V., (Major)

ORG: none

TITLE: Low-altitude attack of ground targets

SOURCE: Aviatsiya i kosmonavtika, no. 5, 1966, 46-49

TOPIC TAGS: air to ground attack, bombing training, low altitude attack, *FIGHTER BOMBER, ATTACK BOMBING*

ABSTRACT: Some information is given on the methods of low-altitude attack of ground targets. The procedure of search from a fighter-bomber for ground targets to be attacked is analyzed. The method of straight-in attack and the maneuvering of fighter-bombers are described. Formulas are given for determining flight elements and maneuvering parameters of the fighter-bomber. Orig. art. has: 1 figure and 5 formulas. [NT]

SUB CODE: 15/ SUBM DATE: none/

Card 1/1

L 9725-66

ACC NR: AP6000256

with respect to the leader. Furthermore, the pilots are able to maneuver with respect to the target, or according to the leader's commands, while still in the clouds. It is not necessary for the group to make visual assembly beyond the clouds. The most important factor is that this method allows flights by formation at night under adverse weather conditions. The authors present a detailed description of the procedure, using as an example an aircraft flying at 900 km/hr. It is noted that experience has shown that the method described is not at all difficult to master.

SUB CODE: 15, 17 / SUBM DATE: None

Card 2/2

I. 9725-66

ACC NR: AP6000256

SOURCE CODE: UR/0209/65/000/011/0054/0055

AUTHOR: Ivanov, A. (Major, Military pilot first class); Belyayev, V. (Major, Military pilot second class)

ORG: None

TITLE: Aircraft flight through clouds

SOURCE: Aviatsiya i kosmonavtika, no. 11, 1965, 54-55

TOPIC TAGS: *formation flying training, interceptor aircraft, airborne radar, radar navigation*

ABSTRACT: Military aircraft pilots sometimes find it necessary to break through clouds in formation in order to intercept their target. Many methods are available to achieve this, but they all have disadvantages. The authors have accumulated some experience in breaking through clouds by a formation of interceptor aircraft, using radar sighting. A method is described which has definite advantages, it is very simple, and does not require prolonged training of the flight personnel. The employment of this method makes it possible to break through the clouds one aircraft at a time; a member of the squadron is able to constantly adjust his position

Card 1/2

40
B

TOKMAGAMBETOV, Sh., gornyy inzh.; BELYAYEV, V., gornyy inzh.

The collective of Mine No.22 of the Karagandaugol' Combine
is celebrating Miner's Day. Ugol' 39 no.8:29-30 Ag '64.
(MIRA 17:10)

1. Shakhta No.22 kombinata Karagandaugol'.

BELYAYEV, Vladimir

Without leaving the battle course. Av. i kosm. 46 no.5:90-95
My '64. (MIRA 17:7)

BELYAYEV, V.

Table for selecting pinions for roll mills. Muk.-elev. prom.
29 no.4:20-21 Ap '63. (MIRA 16:7)

1. Zamestitel' glavnogo inzhenera Vyborgskogo mel'nichnogo
kombinata.
(Grain-milling machinery--Tables, calculations, etc.)

BELYAYEV, V.

Injustice in Orekhovo-Zuevo. Sov. profsoiuzy 18 no.4:24-25
F '62. (MIRA 15:3)
(Orekhovo-Zuevo--Housing)

BELYAYEV, V. (g.Karaganda)

Hope which did not justify itself. Sov. profsoiuzy 18 no.17:
31-32 S '62. (MIRA 15:8)
(Karaganda---Confectioners) (Overtime)

BELYAYEV, V.

Equal to the occasion. Sov. profsoluzy 18 no.8:45 '62.

(MIRA 15:4)

(State farms--Management)

BELYAYEV, V.

Women as welders. Mashinostroitel' no.3:34-35 Mr '62.
(Women--Employment) (MIRA 15:3)

AGAPOV, A., krupchatnik; BELYAYEV, V., krupchatnik

For wider use of caprone sieves. Muk.-elev. prom. 24 no.7:20-21
Jl '58. (MIRA 11:10)

1.Vyborgskiy mel'nichnyy kombinat.
(Grain--Cleaning) (Sieves)

АГАПОВ, А., krupchatnik; БЕЛЫАЕВ, В., krupchatnik

Cleaning grain at the flour mill. Muk-elev. prom. 24 no.6:29
Je '58.

(MIRA 11:7)

1. Vyborgskiy mel'nichnyy kombinat.
(Grain--Cleaning)

BELYAYEV, V.

Successful carrying out of pledges. Mashinostroitel' no. 4:9 Ap '61.
(Izhevsk---Machinery industry) (MIRA 14:4)

BELYAYEV, V.

The ZIL-11 car. IUn.tekh. 3 no.1:26-27 Ja '59.

(Automobiles)

(MIRA 12:1)

BELIAYEV, V. (g.Dnepredzerzhinsk)

In one of the streets of Dnepredzerzhinsk. Prem. keep. no. 9:26 8 '56.
(Dnepredzerzhinsk--Clothing industry) (MIRA 9:10)

BELYAYEV, V.

How we train radio technicians. Radio no.3:10,12 Mr '60.

1. Predsedatel' komiteta Dobrovol'nogo obshchestva sodeystviya
armii, aviatsii i flotu Kirovskogo zavoda, Leningrad.
(Leningrad--Radio)

(MIRA 13:6)

BELIAYEV, V.

The Soviet Academy of Sciences

Conference on weak interactions. Atom. energ. 14 no.4:423 Ap
'63. (MIRA 16:3)

(Nuclear reactions)

BELYAYEV, V., inzh.-kapitan 1 ranga

Armament of modern submarines (as revealed by foreign press data).
Voen.znan. 38 no.8:23-24 Ag '62. (MIRA 15:8)
(United States--Submarine warfare)
(United States--Rockets (Ordnance))

BELIAYEV, T.G.

Use of polymers in the construction of geological prospecting
machinery. Trudy TSKB no.5:88-90 '62. (MIRA 18:7)

ACC NR: AP7002435

sharp change in mechanical properties between -196 and -253C indicates that the alloy has a tendency to embrittlement. Fracture of VN2 alloy specimens was ductile at 20 and -196C, and brittle at -253. The results of tests showed that VN2A niobium alloy can be used in structures operating under multiaxial stresses at high and low temperatures.

[WA-88]

[TD]

SUB CODE: 11/ SUBM DATE: none/ ATD PRESS: 5114

Card 3/3

ACC NR: AP7002435

uniform and fine-grained. Alloying with molybdenum was found to raise the nil ductility transition temperature. Consequently, the molybdenum content in niobium alloys should not exceed 4%. Additional alloying of niobium-molybdenum alloys with zirconium significantly increased their ductility and notch toughness at -196°C . Lowering the test temperature to -253°C resulted in increased tensile and yield strength and decreased elongation and notch toughness in NV2A niobium alloy (see Fig. 1). The

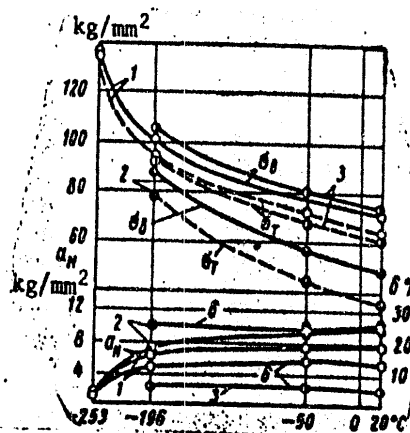


Fig. 1. Low-temperature mechanical properties of VN2A alloy (cold-rolled sheet).

- 1 - Annealed at 1000°C for 30 min;
- 2 - annealed at 1300°C for 1 hr;
- 3 - as rolled.

Card 2/3

ACC NR: AP7002435

SOURCE CODE: UR/0219/66/000/012/0034/0036

AUTHOR: Zakharova, G.V.; Yermakova, Ye. M.; Belyayev, S. Ye.

ORG: none

TITLE: Mechanical properties of niobium and its alloys at low temperatures

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 12, 1966, 34-36

TOPIC TAGS: niobium, niobium alloy, ~~mechanical~~ ^{mechanical} property, ~~thermodynamic~~ ^{thermodynamic} property/VN1 niobium alloy, VN2 niobium alloy, VN2A niobium alloy

ABSTRACT: Specimens of VN1 niobium and VN2 and VN2A niobium alloy, as-deformed, stress-relieved at 1100C, or recrystallization annealed at 1200C, were subjected to tensile and impact tests at temperatures from -253 to 20C. It was found that stress relieving had little or no effect on the mechanical properties of VN1 niobium. Recrystallization annealing lowered the tensile strength from 98 to 89 kg/mm², the yield strength from 95 to 88 kg/mm², and increased the elongation from 15 to 21% and the notch toughness from 19 to 25 kg/cm² (tested at -196C), compared to as-deformed alloy. The microstructure of recrystallized VN1 niobium was

Card 1/3

UDC: 620.17:669.293:66.974

L 47038-66 EWT(m)/EWP(w)/T/EWP(t)/ETI LJP(c) JD/JH

ACC NR: AT6024918

(A, N)

SOURCE CODE: UR/2981/66/000/004/0085/0106

AUTHOR: Anisimova, N. V.; Archakova, Z. N.; Belyayev, S. Ye.; Danilov, Yu. S.; Kishkina, S. I.; Petrov, Ye. A.; Plekhanova, N. G.; Ponar'ina, T. K.; Radetskaya, E. M.; Strunin, B. M.

ORG: none

TITLE: Mechanical properties of VAD23 alloy

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy (Heat resistant and high-strength alloys), 85-106

TOPIC TAGS: aluminum alloy, solid mechanical property / VAD23 aluminum alloy

ABSTRACT: Sections and sheets of VAD23 alloy were tested in the artificially aged state (16 hr at 170°C). From the standpoint of creep, stress-rupture strength and recovered strength, the properties of VAD23 are 20-25% higher than those of D16T under long-term performance conditions at 125-150°C. In compression at temperatures up to 150-175°C, the yield points of sheets and sections of VAD23 are 10-20% higher than in extension. From the standpoint of endurance and fatigue strength, VAD23 is not inferior to V95 alloy. VAD23 has a high sensitivity to notching and sharp cracks; sheets of VAD23 alloy display a high sensitivity to notching and cracking as compared to pressed semifinished products. 40rig. art. has: 12 figures and 14 tables.

SUB CODE: 11/ SUBM DATE: none / ORIG REF: 003/ OTH REF: 005

Card 1/1 vmb

BELYAYEV, S.Ye.

Method of determining the crack susceptibility of high-strength materials during tensile tests. Zav. lab. 29 no.9:1119-1122 '63.
(MIRA 17:1)

On notch sensitivity of high-strength steels

2087 S/124/61/000/008/041/042
A001/A101

linearly related to strength reduction at skewing. This makes it possible to judge on sensitivity to skewing without a special direct test.

N. Davidenko

[Abstracter's note: Complete translation]

18.8200

26337

S/124/61/000/008/041/042
A001/A101

AUTHOR: Belyayev, S. Ye.

TITLE: On notch sensitivity of high-strength steels

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 8, 1961, 55-56, abstract 8v486
(V sb. "Ustalost' metallov", Moscow, AN SSSR, 1960, 72-79)

TEXT: The author investigated the effects of an axial-symmetrical notch, a side notch, and a skewed notch, on the static strength of over 20 grades of structural steel with yield strength from 80 to 200 kg/mm². At room temperature in the first case the notch always increased strength; in the second and third cases, a decrease of strength was observed, which was the greater the higher the strength of a smooth specimen and the lower its ductility. At test temperature reduction, a decrease in the yield strength was observed also in the specimens with an axial-symmetrical notch; this "temperature of notch sensitivity appearance" is linearly related to strength reduction at skewing. The author determined also deformational notch sensitivity (ratio of constriction of a smooth specimen to that of a symmetrically notched specimen) which turned out to be

Card 1/2

PHASE I BOOK EXPLOITATION

BCH/16579

Dentalists' malpractice insurance A.A. Bayshore

September 22-26, 1958; Materials of the Conference
of Metals, September 22-26, 1958; Metallurgy
and Metals, September 22-26, 1958.

Dep. Ed.: T.A. Oling, Corresponding Member, Academy of Education
 201 P. 3500 copies printed

WILLIAM: Mrs. CUNNING; Tech. Ed.: I.J. Dorothea.

mechanists, and scientific research workers.

...this section contains discussions relating to fatigue failure of metals, fatigue in finished parts, and methods for testing and analyzing fatigue.

physical regularity by patterns, and features of steel failure caused by fatigue. Possibilities for applying a new criterion of the regularity of steel failure.

corrosion fatigue of metals is discussed along with data on the effect of stress on the rate of corrosion.

As a result of testing the tensile strength of such metal parts as large-size plates and various parts of such internal machinery as pistons, connecting rods, and crankshafts, it was found that the tensile strength of the metal parts of the engine was not reduced by the use of the process.

personalities are mentioned. Each article is accompanied by bibliographic references, most of which are in French.

and by: Khandrikova, Gena; Datta on Physical Remission of Steel Pileless Piers; 1964; 10 p. 10 refs. 10 refs.

Abstract. Soil Resistance Under Repeated Loading and Resistance to Brittle Failure. 27

34
KOLLEGE, I.A., and S. Ye. Oshchepkov

[illegible]

62

72

8

Order: I. I. Marikuts, and A. I. Yefimov.

ing, I.A. and 8. Te. Gannysch. Diagram of erecting a Pallas Diagram
for Pallas. 97

the True Stress Concentration Coefficient

106

Palique Strength of Large Plates

range Strength of Roller Chains

2003, M.B. Connection Between the Strength of the Post-Tensioning of Pump Rods 235

of static, cyclic and impact loads

Specimens With Beating Alloy

17400-4577

YL/vtc/mjs

[illegible]

100

Journal of Interpersonal Violence 26(1) 1–17
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100

BELYAYEV, S. Ye. and DAVIDENKOV, N. H.

"Toughening of Steel During the Precipitation of Carbides," ZhTF, 22, No. 1,
pp 40-43, 1952.

USSR/Metals

Jul 49

Notch Test

"Influence of Size of Specimen on Notch Sensitivity of Steel and Light Alloys," S. Ye. Belinger, All-Union Inst of Avn Materials, 7 pp

"Tavod Lab" No 7

Influence of specimen size has not been investigated sufficiently despite general knowledge of subject. Carried out tests with welded steel material (with and without bending) to determine effect on graphs. Concludes that tensile strength and plasticity decrease considerably as specimen size decreases.

62/49187

USSR/Metals (Contd)

Jul 49

Notched on graphs. Concludes that tensile strength and plasticity decrease considerably as specimen size increases (under complex loading).

62/49187

COMMON ELEMENTS										1ST AND 2ND ORDERS										3RD AND 4TH ORDERS										COMMON VARIANTS INDEX																																																																																																																																	
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<p>Notch susceptibility (of metals) to cutting. N. N. Davidenkov and S. R. Belenok (Sov. Pat., 1948, 18, 983-988; J. Iron Steel Inst., 1949, 181, 394).—The impact susceptibility to cutting of metals is discussed in relation to the nature of the notch and specimen shape. The notch effect is defined as the ratio of the difference between the yield strength of a notched and a smooth specimen to the yield strength of the smooth specimen. This ratio may have a positive or negative value; methods of determining its sign and magnitude, and results of tests on a no. of steels and alloys subjected to various heat-treatments are discussed. A shape of specimen is proposed by use of which the sign of the above ratio can be determined from results of a single test for longitudinal fracture.</p> <p>R. B. CLARKE.</p>																																																																																																																																																															
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BELYAEV, S. P. PROCESSES AND PROPERTIES INDEX			
<p>9-156. Effect of Method of Notching of "Menage" Specimens on Impact Testing of Steel. S. E. Belyaev and T. K. Panur'ima. <i>Factory Laboratory (U.S.S.R.)</i>, v. 13, April 1947, p. 500-501. (In Russian.) Specimens prepared by three methods. Lowest impact resistances shown for specimens prepared by abrasive-wheel cutting after hot working.</p>			
<p>ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
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<p><i>M</i> BELUBEV, S. G.</p> <p>*Behaviour of Metals and Method of Testing at Low Temperatures. S. F. Belubev (Tekhnika Vozdushnogo Flota (Tech. of Air Fleet), 1936, (10), 97-106). [In Russian.] The impact strength of Duralumin increases with decrease in temperature, being 3-15, 3-65, and 3-83 kg./cm.², respectively, at + 20°, - 40°, and - 70° C.—N. A.</p>																																																			
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BELYAYEV, Sergey Vasil'yevich; ZABOYEVA, Iya Vasil'yevna; POPOV,
Vyacheslav Aleksandrovich; RUETSOV, Dmitriy Mikhaylovich;
IVANOVA, Ye.N., doktor sel'khoz. nauk, prof., otv. red.

[Soils of the Pechora Industrial Region] Pochvy Pechorskogo
promyshlennogo raiona. [By] S.V.Beliasv i dr. Moskva,
Nauka, 1965. 110 p. (MIRA 18:3)

BELYAYEV, S.V.; arkhitekt; VOINOV, A.P., prof., nauchnyy rukovoditel'

History of the utilization of plastic materials in construction
and architecture. Sbor.nauch.trud.Bel.politekh.inst. no.81:
61-79 '59. (MIRA 13:5)
(Plastics)

VOINOV, A.P., professor; ZYSMAN, A.I., dotsent; KULIN, V.I.; BELYAYEV, S.V., arkhitekotor; BELSHCHIK, N.P., inzh.; VOINOV, V.A.

New designs of precast apartment houses built of spatial elements.
Sbor.nauch.trud.Bel.politekh.inst. no.81:15-60 '59.

(MIRA 13:5)

(White Russia--Apartment houses)
(Precast concrete construction)

BRIVAY, J. V.

Fetus

Abdominal pregnancy of 25 years duration. Akush. 8 gin. No. 5, 1952.

Monthly List of Russian Accessions, Library of Congress
December 1952. UNCLASSIFIED

ACC NR: AP7011376

SOURCE CODE: UR/0367/66/004/005/0936/0952

AUTHOR: Belyayev, S. T.

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy universitet)

TITLE: Coherent pairing fluctuations and collective 0^+ -excitations of nuclei

SOURCE: Yadernaya fizika, v. 4, no. 5, 1966, 936-952

TOPIC TAGS: excited nucleus, excitation cross section, particle interaction

SUB CODE: 20

ABSTRACT: The collective 0^+ excitations in nuclei, connected with the interaction in the particle-particle channel are investigated in the framework of the self-consistent time-dependent field method. Two classes of excitations with different time parities were found, both being coherent pairing fluctuations. The T-even branch (predicted earlier by Bohr and Mottelson) is characterized by weak E0-transitions to the ground state, whereas the T-odd branch has a large EC-transition probability. The excitation cross sections in the (t,p)-reaction are considered and they prove to be of the same order of magnitude for both types of branches. Orig. art. has: 8 formulas.

[Based on author's Eng. Abst.] [JPRS: 40,393]

Card 1/1

0931 1770

L 20389-66

ACC NR: AP6005873

ory. Consequently the authors use a previously proposed analysis (YaF v. 1, 17, 1965) of higher approximations for solving such a problem. In the present case the system of equations for the Green's functions can be made closed by using approximate relations of the Ward type, an investigation of the singularities of the electromagnetic transitions in a system with low-lying collective excitations becomes possible. The Green's function, the vertex parts, and the probabilities of the electromagnetic transitions are determined by means of general formulas previously obtained (YaF v. 2, 51, 1965) for transition between states of arbitrary nature. The results obtained are found to be incompatible with the usual assumptions of the Fermi-liquid theory, since the obtained spectrum of the quasiparticle is characterized not only by single-particle quantum numbers, but acquires an additional collective parameter, and the interaction connected with the phonon exchange is strongly retarded. Possible applications of the method to real nuclei with high spins are discussed. Orig. art. has: 2 figures and 94 formulas.

SUB CODE: 20/ SUBM DATE: 09Apr65/ ORIG REF: 005/ OTH REF: 004

Card 2/2 *JKR*

L 20389-66 EWT(m) DIAAP

ACC NR: AP6005873

SOURCE CODE: UR/0367/65/002/004/0615/0634

AUTHOR: Belyayev, S. T.; Zelevinskiy, V. G.

ORG: none

TITLE: The Green's function method in a simple nuclear model

SOURCE: Yadernaya fizika, v. 2, no. 4, 1965, 615-634

TOPIC TAGS: Green function, nuclear structure, phonon, nuclear shell model, nucleon interaction, phonon interaction

ABSTRACT: In order to check on the efficiency of the Green's function method in the theory of the Fermi liquid for finite systems with low-energy collective excitations, the authors consider a simple model of a spherical nucleus, wherein nucleons at one isolated level with large angular momentum $j \gg 1$ interact via exchange of collective excitations--quadrupole phonons (pairing between nucleons is assumed already to be accounted for). This is also the fundamental interaction in real nuclei for low-lying excitations. The limitation to a single level is quite close to reality for nuclei where the filled level has a parity different from that of the remaining levels of the given shell (for example, the proton $g_{7/2}$ level in the region of In^{115}). Since the nucleon-phonon interaction in the nucleus is too weak, it becomes necessary to use methods going beyond perturbation the-

Card 1/2

L 11789-66

ACCESSION NR: AP5020253

SUBMITTED: 22Feb65

ENC: 00

SUB CODE: 20

NR REF SOV: 005

OTHER: 000

HW
Card

2/2

L 11789-66 EWT(m) DIAAP

ACCESSION NR: AP5020253

UR/0367/65/002/001/0051/0058

AUTHOR: Belyayev, S. T.; Zelevinskiy, V. G.

TITLE: Green's functions and transition probabilities in odd nuclei

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 51-58

TOPIC TAGS: Green function, transition probability, fermion, phonon, ground state

ABSTRACT: Expressions are obtained for various Green's functions of odd nuclei. These expressions make it possible to calculate the nuclear characteristics for states having either a single-particle or a collective nature. The method consists in going over from averaging over the ground state of the odd nucleus to averaging over the neighboring nucleus. This makes it possible to eliminate the uncertainty connected with degeneracy in the ground state. Explicit equations are derived for the single-fermion, phonon, and two-particle Green's functions. Transition probabilities and mean values of the physical quantities are also derived for arbitrary low-lying states in odd nuclei. Orig. art. has: 34 formulas.

ASSOCIATION: None

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L 41008-65
ACCESSION NR: AF500770

D. Lawson, J. J. Urstke, Phys. Rev., 108, 1300, 1957; A. de Shalit, Phys. Rev., 122, 1330, 1959; A. Brautstein, A. de Shalit, Phys. Lett., 1, 264, 1962), the number of arbitrary parameters coincides with the number of experimental facts and, consequently, the applicability of the model seems not be based on sufficiently firm grounds. In some limiting cases, analytical expressions for the Green function are found here in the form of sums over an infinite number of pole terms. Physical consequences of the nucleon-phonon interactions in odd-A nuclei are discussed (isomeric level shift, quadrupole and magnetic nuclear moments, electromagnetic transition probabilities), and the authors conclude that one must be particularly careful when using the one-particle Green's function of the Fermi-liquid theory (containing only a single pole component) in place of the exact one-nucleon nuclear function. "D. P. Grachukha pointed out to us that the average number of phonons may vary considerably due to the large difference in the spins of the ground and metastable levels." Orig. art. has: 37 formulas and 7 figures.

ASSOCIATION: None

SUBMITTED: 12 Jun 64

NO REF SOV: 106

ENCL: 00

OTHER: 008

SUB CODE: MF

Card 2/2 533

1. NAME _____

ALCOHOL ABUSE

S/0367/65/001/001/0013/0016

AUTHORS: Bel'tsev, G. I., Zolovinskiy, V. G.

12704 The use of spectrum of odd A spherical nuclei

SOURCE: Voprosy Ekonomiki, v. 1, no. 1, 1963, 13-26

TOPIC TAGS: odd spherical nucleus, collective nuclear motion, phonon nucleon model, phonon nucleon interaction, odd A nucleus, nuclear energy spectrum

ABSTRACT: Since the low excited states of spherical even-even nuclei can be described with sufficient accuracy by their collective motion (S. T. Belyayev, *Fiz.-Mat. Nauk, Len. Vys. Shkol.*, 2, 11, 1959; S. T. Belyayev, *ZhETF*, 39, 1387, 1960) the authors studied the excitations of odd - A spherical nuclei theoretically assuming that the basic interaction is that of the odd nucleon with collective excitations of the even core (phonons). Such an assumption is justified for vibrational collective excitations. The phonon-nucleon interaction is not considered weak. Such a microscopic study (with a limited number of arbitrary constants) is of considerable importance since during the usual semi-empirical comparison of the model with the experimental results (see, e.g., E.

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L 41007-65

ACCESSION NR. AP3007439

one. In this paper, dealing with the first-mentioned subproblem, the author obtained, using the Green function method, a Hamiltonian containing nucleons and collective excitation phonons for a spherical nucleus model with simple residual interaction between the nucleons (cooper pairing + quadrupole interaction). The distortion of the phonon propagation and of the nucleon-phonon vertex part is investigated with other types of interactions present. The use of the nucleon-phonon Hamiltonian significantly simplifies the investigation of many-particle correlations in spherical nuclei. Orig. art. has: 48 formulae.

ASSOCIATIONS: None

SUBMITTED: 12/1/64

ENCL: 00

SUB CORR: 00

NO REF SOV: 001

OTHER: 003

Ref
 Cont 2/2

1-10007-63 ETC(a) 1-63 DIAAP

ACQUISITION REF: 1-10007-63

3/0361/64/001/0003/0012

AUTHOR: Belavany, S. T.

TITLE: A nucleon-phonon Hamiltonian for spherical nuclei

SOURCE: Nuclear Physics, vol. 1, no. 1, 1965, 3-12

TOPIC TAGS: spherical nucleus excitation, modified shell model, nucleon-phonon Hamiltonian, phonon propagator distortion

ABSTRACT: Lately, significant progress has been made in the theoretical explanation of the spectra from spherical nuclei using the shell model and then taking into account only the most substantial part of the residual nuclear interactions (see, e.g., L. S. Kisslinger, R. A. Sorensen, Mat. Fys. Medd. Dan. Vid. Selsk., 42, 2, 1960; Rev. Mod. Phys., 36, 856, 1963). However, the problem related to the higher excited states is quite complex and the problem of determining spectra from higher excited levels of the nucleus may be decomposed into two sub-problems: 1) the investigation of the phonon types and the study of their interaction with nuclei, and 2) the determination of the excitation spectrum within a model system consisting of phonons and, perhaps, of unbound nucle-

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BELYAYEV, S.T.; ZELEVINSKIY, V.G.

Anharmonicity of the oscillations of spherical nuclei. Izv. AN
SSSR. Ser. fiz. 28 no.1:127-132 Ja '64. (MIRA 17:1)

BELYAYEV, S. T.

"A new derivation of nuclear collective Hamiltonians."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics,
Paris, 2-8 Jul 64.

"Anharmonic effects" ...

S/056/62/042/006/026/047
B104/B108

the form of the anharmonic corrections than the energy of the nuclear levels.

SUBMITTED: December 31, 1961

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3/056/62/042/006/026/047
B104/B108

AUTHORS: Belyayev, S. T., Zelevinskiy, V. G.

TITLE: "Anharmonic effects" of quadrupole oscillations of spherical nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1590 - 1603

ABST: Deviations from the harmonic fundamental oscillations are studied in the scope of the microscopic theory of collective excitations of spherical even-even nuclei. The number of independent phenomenological constants for describing the anharmonic corrections of quadrupole oscillations of spherical nuclei can be reduced considerably. In adiabatic approximation, the perturbation $H^{(1)}$, i. e. the term of the Hamiltonian containing three phonon operators, is determined by only one constant.

$H^{(2)}$ contains only three constants which can be approximated asymptotically by one constant. All constants can be calculated for real nuclei. The probability of electromagnetic E2 transitions is much more sensitive to

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Calculation of the ...

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B102/B201

If ω is eliminated one obtains $\langle H \rangle = W_0 + \frac{1}{2} \frac{\mathcal{J}^2}{\mathcal{I}}$, where \mathcal{I} is the moment of inertia. \mathcal{J} decomposed into components gives

$$\mathcal{J} = \mathcal{J}^{(1)} + \mathcal{J}^{(2)} + \mathcal{J}^{(3)},$$

$$(20) \quad \mathcal{J}^{(1)} = \sum_{12} \frac{|K11|L_x|2\rangle|^2}{E_1 + E_2} (u_1 v_2 - v_1 u_2)^2, \quad (20)$$

$$- \langle 1\bar{1}' | G | 2\bar{2}' \rangle (u_1 v_2 - v_1 u_2)^2 (u_1 v_2' - v_1 u_2') f_{12} \omega^{-1}. \quad (22)$$

Taking account of rotation with the adiabatic perturbation theory yields only the first component $\mathcal{J}^{(1)}$; this method is equivalent to taking account only of the diagonal corrections to $\langle 11 \rangle$. $\mathcal{J}^{(2)}$ takes into account the effect of rotation upon the pairing and $\mathcal{J}^{(3)}$ describes the change of the self-consistent field of nucleons due to rotation.

$\mathcal{J}^{(1)} \rightarrow 0$ for $\Delta \rightarrow \infty$, $\mathcal{J}^{(2)} \rightarrow 0$ for $\Delta \rightarrow 0$, and $\mathcal{J}^{(3)}$ give a correction to \mathcal{I} of the order of $A^{-1/3}$. There are 3 Soviet-bloc references.

SUBMITTED: September 15, 1960

Card 6/6

Calculation of the ...

S/056/61/040/002/043/047
B102/B201

where W_0 is a term not containing f , E is the quasiparticle energy;

$$(16) \quad E_1 = \sqrt{(\tilde{\epsilon}_1 - \lambda)^2 + \Delta_1^2},$$

$$\tilde{\epsilon}_1 = \epsilon_1 - \sum_2 \langle 12 | G | 21 \rangle - \langle 12 | G | 12 \rangle \epsilon_2^*, \quad \Delta_1 = \sum_2 \langle 1\bar{1} | G | \bar{2}2 \rangle u_2 v_2.$$

The gap Δ in the quasiparticle spectrum characterizes the pairing. From a variation of $\langle H \rangle + \langle H_0 \rangle$ with respect to f_{12} one obtains for f_{12} the integral equation

$$(17) \quad (E_1 + E_2) f_{12} - \sum_{1'2'} \langle 1\bar{2} | G | \bar{2}'1' \rangle (u_1 u_2 + v_1 v_2) (u_{1'} u_{2'} + v_{1'} v_{2'}) f_{1'2'} +$$

$$+ \sum_{1'2'} (\langle 1\bar{1}' | G | \bar{2}2' \rangle - \langle 1\bar{1}' | G | \bar{2}2' \rangle) (u_1 v_2 - v_1 u_2) (u_{1'} v_{2'} - v_{1'} u_{2'}) f_{1'2'} =$$

$$= \omega (u_1 v_2 - v_1 u_2) \langle 1 | j_x | 2 \rangle. \quad (17)$$

(14) can thus be represented in the form

$$(18) \quad \langle H \rangle = W_0 + \frac{1}{2} \omega^2 \sum (u_1 v_2 - v_1 u_2) \langle 1 | j_x | 2 \rangle f_{12} \omega^{-1}$$

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Calculation of the ...

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B102/B201

$$\langle a_1^+ a_1 \rangle = v_1^2 + (u_1^2 - v_1^2) \sum_2 |f_{12}|^2, \quad (11)$$

$$\langle a_1^+ a_1^+ \rangle = \langle a_1^- a_1^- \rangle = u_1 v_1 - 2u_1 v_1 \sum_2 |f_{12}|^2$$

as well as the off-diagonal terms

$$\begin{aligned} \langle a_1^+ a_2 \rangle &= (u_1 v_2 - v_1 u_2) f_{12}, \\ \langle a_1^+ a_2^+ \rangle &= \langle a_2^- a_1^- \rangle = (u_1 u_2 + v_1 v_2) f_{12}. \end{aligned} \quad (12)$$

are non-vanishing ($f_{12}^* + f_{21} = 0$). By (11) and (12) it is possible to calculate the mean values of H and $H\omega$; one obtains

$$\begin{aligned} \langle H \rangle &= W_0 + \frac{1}{2} \sum_{12} (E_1 + E_2) |f_{12}|^2 - \\ &\quad - \frac{1}{2} \sum \langle 1\tilde{2} | G | \tilde{2}'1' \rangle (u_1 u_2 + v_1 v_2) (u_1 u_2' + v_1 v_2') f_{12} f_{1'2'} + \\ &\quad + \frac{1}{2} \sum (\langle 1\tilde{1}' | G | \tilde{2}'2 \rangle - \langle 1\tilde{1}' | G | 2\tilde{2}' \rangle) (u_1 v_2 - v_1 u_2) (u_1 v_2' - v_1 u_2') f_{12} f_{1'2'}, \end{aligned} \quad (14) \quad (15),$$

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$$\langle H_\omega \rangle = -\omega \langle J_x \rangle = -\omega \sum \langle 1 | j_x | 2 \rangle (u_1 v_2 - v_1 u_2) f_{12},$$

Calculation of the ...

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B102/3201

state of the system is sought with a fixed mean value of the projection of the moment onto an axis perpendicular to the nuclear axis. The term $H_\omega = -\omega \hat{J}_x = -\omega \sum \langle 1 | j_x | 2 \rangle a_1^+ a_2$ is added to the Hamiltonian ($\langle \hat{J}_x \rangle = J_x$); for the annihilation of the terms $\alpha \alpha$ and $\alpha^+ \alpha^+$ in the total Hamiltonian $H' = H_0 + H_\omega$, an additional canonical transformation is performed:

$\alpha_\nu \rightarrow \alpha_\nu(\omega) + \sum_{\nu'} f_{\nu\nu'} \alpha_{\nu'}^+(\omega)$; the factors $f_{\nu\nu'}$ are related to the rotational term

$H_\omega(f_{\nu\nu'}, \omega)$. They are regarded as being small and are considered only in first approximation; $f_{\nu\nu'} + f_{\nu'\nu} = 0$, $f_{\nu\nu} = 0$. For the new quasiparticles

$\alpha_\nu(\omega)$ the vacuum state is given by (10); $(\Psi_0, \Psi_0) = \exp\left(\frac{1}{2} \sum_{\nu\nu'} |f_{\nu\nu'}|^2\right)$

the function (10) is not normalized: $(\Psi_0, \Psi_0) = \exp\left(\frac{1}{2} \sum_{\nu\nu'} |f_{\nu\nu'}|^2\right)$. For

determining the factors $f_{\nu\nu'}$, it is necessary to determine the minimum of the mean value of the total Hamiltonian H' in the state (10). The diagonal terms

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Calculation of the ...

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where $a_{\nu_1}^+, (a_{\nu_1})$ denotes the production (destruction) operators of the nucleon in the state $\nu_1 \equiv 1$, $\epsilon_{\nu} \equiv \epsilon_1$ denotes the energy of this single-particle state, λ is the chemical potential of the system. The pairing is taken into account by introducing quasiparticles by a canonical transformation $a_{\nu} = u_{\nu} \alpha_{\nu} + v_{\nu} \alpha_{\tilde{\nu}}^+$, $\alpha_{\nu} = u_{\nu} a_{\nu} - v_{\nu} a_{\tilde{\nu}}^+$, where $\tilde{\nu}$ is a state conjugate with time with respect to ν and of the same energy; the transformation factors obey the conditions $u_{\tilde{\nu}} = u_{\nu}$, $v_{\tilde{\nu}} = -v_{\nu}$, $u_{\nu}^2 + v_{\nu}^2 = 1$. An equivalent is the condition of minimization of the quasiparticle vacuum state ($\alpha \Psi_0 = 0$):

$\Psi_0 = \prod_{\nu} (u_{\nu} + v_{\nu} a_{\tilde{\nu}}^+ a_{\nu}^+) |0\rangle$ (4). The calculation of the mean values with (4) is equivalent to an independent averaging of operator pairs, e.g.,

$$(5) \langle a_1^+ a_2^+ a_3 a_1 \rangle_0 = \langle a_1^+ a_1 \rangle_0 \langle a_2^+ a_2 \rangle_0 - \langle a_1^+ a_2 \rangle_0 \langle a_3^+ a_1 \rangle_0 + \langle a_1^+ a_2 \rangle_0 \langle a_3^+ a_1 \rangle_0,$$

where only the "diagonal" terms are non-vanishing $\langle a_1 a_1^+ \rangle = v_1^2$,

$\langle a_1^+ a_1^+ \rangle_0 = \langle a_1 a_1 \rangle_0 = u_1^2 v_1$. For determining the moment of inertia the lowest

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S/056/61/040/002/043/047
3102/3201AUTHOR: Belyayev, S. T.

TITLE: Calculation of the moment of inertia of nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,
no. 2, 1961, 672-675

TEXT: The moment of inertia of deformed nuclei under consideration of superfluidity (Cooper-type pairing of nucleons) has been earlier calculated by the author within the framework of the adiabatic perturbation theory (Math.-Fys. Dan. Vid. Selsk., 31, 11, 1959); A. B. Migdal (ZhETF, 37, 249, 1959) has applied the method of the Green function to show that a perturbation-theoretical consideration of the rotational energy is insufficient, since the Cooper pairs themselves are affected by rotation, which fact gives rise to an additional component of the moment of inertia. As is shown here, a successive application of the method of canonical transformation leads to the same result. Nucleons in the deformed self-consistent field are described by the Hamiltonian

$$(1), \quad H = \sum_{v_i} (e_{v_i} - \lambda) a_{v_i}^{\dagger} a_{v_i} - \frac{1}{2} \sum \langle 12 | G | 2'1' \rangle a_1^{\dagger} a_2^{\dagger} a_{1'} a_{2'}$$

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86915

The Nature of the First Excited States of
Even-even Spherical Nuclei

S/056/60/039/005/032/051
B006/B077

favors the production of bound states of particles and holes with $J = 2$ momenta. Macroscopically these excitations can be considered as oscillations of the quadrupole moment of the outer nucleons. The surface oscillations which occur are only a result of the static polarizability of the core and are not related to hydrodynamic surface oscillations. All these results are not related to the calculations based on the j -level model. Which of the possible bound states is realized, has to be cleared phenomenologically. The author thanks V. M. Galitskiy and A. B. Migdal for discussions. L. P. Gor'kov is mentioned. There are 3 figures and 13 references: 4 Soviet, 2 Danish, 4 US, 1 French, and 1 German.

SUBMITTED: June 21, 1960

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86915

The Nature of the First Excited States of
Even-even Spherical Nuclei

S/056/60/039/005/032/051
B006/B077

filling of the upper shells has already been determined and correspond qualitatively to experimental results. The author examines the microscopic structure of these oscillations and gives a detailed explanation of their nature and a determination of the relationship with single-particle representations. In order to clarify these interrelations only interactions due to pairing are considered and quadrupole interactions of the nucleons are regarded as possible collective excitations in any type of interaction. The influence of polarizability of the core upon the effective interactions of the nucleons with nucleons is studied. The nature of the collective excitations and the condition for their arising is examined for the special case of non-filled j-shells. The results obtained are valid qualitatively also in the general case. The investigations yielded the following results: According to the type of interaction in spherical nuclei "bound" (correlated) states of pairs with nonvanishing momenta as Cooper-type pairs as well as particle-hole type pairs, etc can be formed. This possibility occurs only at pairing, that is in the case of existence of a condensate of Cooper pairs with zero momenta. Polarization of the core leads to a large increase of effective quadrupole interactions between the outer nucleons which

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B006/B077

24.6200

AUTHOR:

Belyayev, S. T.

TITLE:

The Nature of the First Excited States of Even-even
Spherical Nuclei

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 39, No. 5(11), pp. 1387 - 1400

TEXT: The spectra of the excited states of even-even non-deformed nuclei showed certain known rules governing position, spin, and parity of the different levels and also transition characteristics and probabilities; it is tried to use a model to describe these findings theoretically. The model of hydrodynamic surface oscillations shows a number of shortcomings. The author showed already in a previous study that when considering the nucleon pair correlation and the nucleon "quadrupole" interaction, a new type of oscillation of the spherical nucleus appears which is not of hydrodynamic nature. These oscillations are related to the change of the configurations of the outer nucleons. The energy, mass coefficient, and dependence of the oscillations on the

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